



**Prize Winner**

# Science Writing Year 3-4

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This Scientific Writing entry for the Oliphant Science Awards is a book called “Bioluminescence.” The comic format is a fun way to show how different sea creatures produce bioluminescence. Information is written underneath for more scientific explanation.

References:

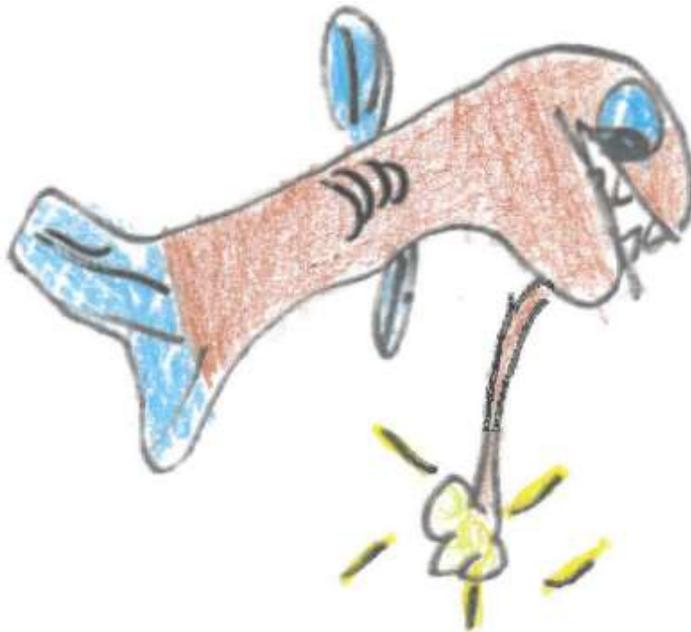
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- Molloy, L., *Creatures of the Deep*, Double Helix Magazine, CSIRO, 1 June 2022 (Issue 56)
- *Life that Glows*, 2016, David Attenborough, BBC Television
- *Bioluminescence*, 2022, National Geographic website,  
<https://education.nationalgeographic.org/resource/bioluminescence>

Written, typed and illustrated by Patrik Porter. My mum helped me to scan the pictures and format the book. Word count: 865

# Bioluminescence

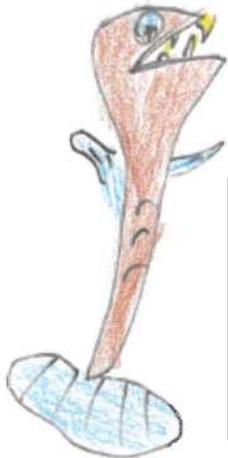
By Patrik Porter

Mr Whip's birthday



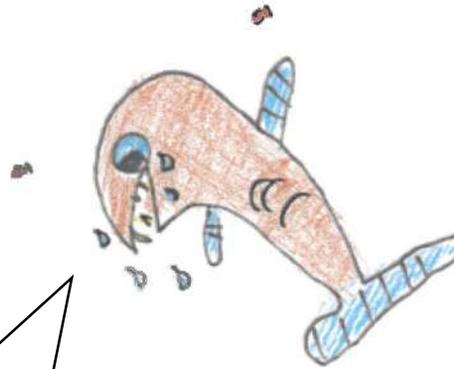
Featuring MR WHIP  
the whip dragon fish

DEEP IN THE OCEAN...  
...IN THE TWILIGHT ZONE...



HELLO! I'M MR  
WHIP. IT'S MY  
BIRTHDAY AND I'M  
GOING TO HAVE A  
PARTY!

BUT HOW DO I  
FIND MY FRIENDS  
IN THE DARK?



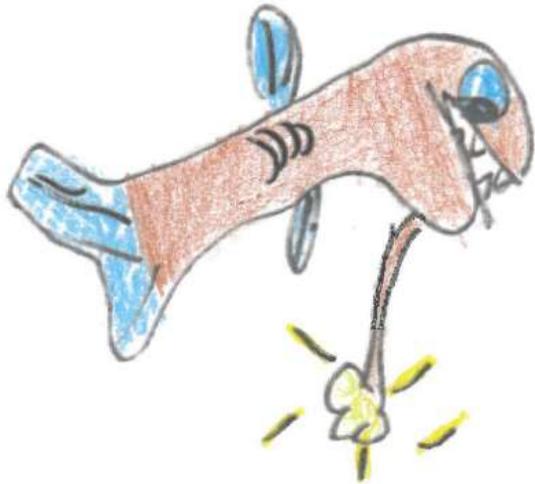
I HAVE  
AN IDEA!



The ocean is a deep and dark place. As you get deeper, little or no light comes down from the surface. Sea creatures need to use different ways to see in the dark. Some have really big eyes, and some can make their own light. The most widespread bioluminescent animal in the world are dinoflagellates, which are one-celled marine organisms. When you disturb them, they produce a chemical reaction which makes them glow. This is bioluminescence!

Whip dragon fish (*Grammatostomias flagellibarba*) live in the Twilight Zone.

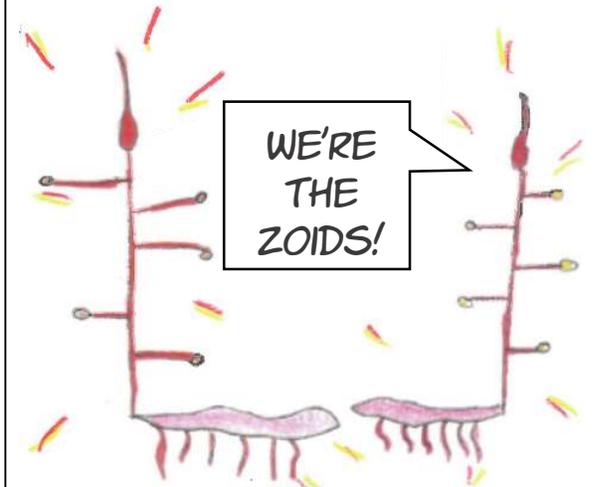
MR WHIP SETS OFF TO FIND FRIENDS TO INVITE TO HIS PARTY...



OOH LIGHT!  
WHERE IS IT  
COMING FROM?



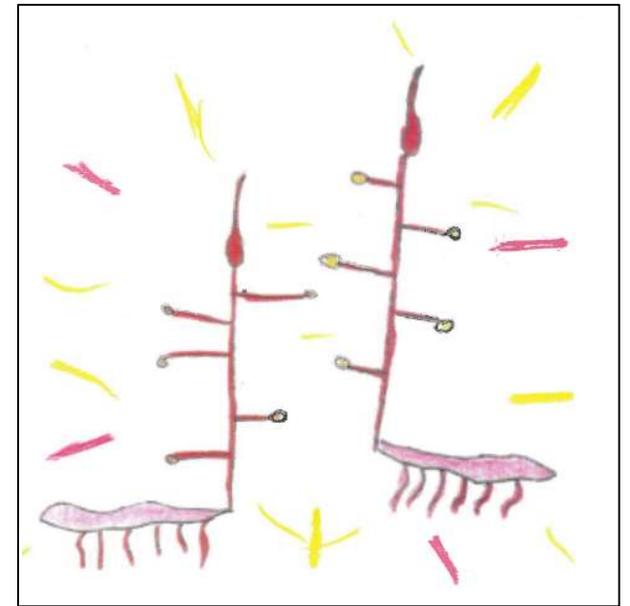
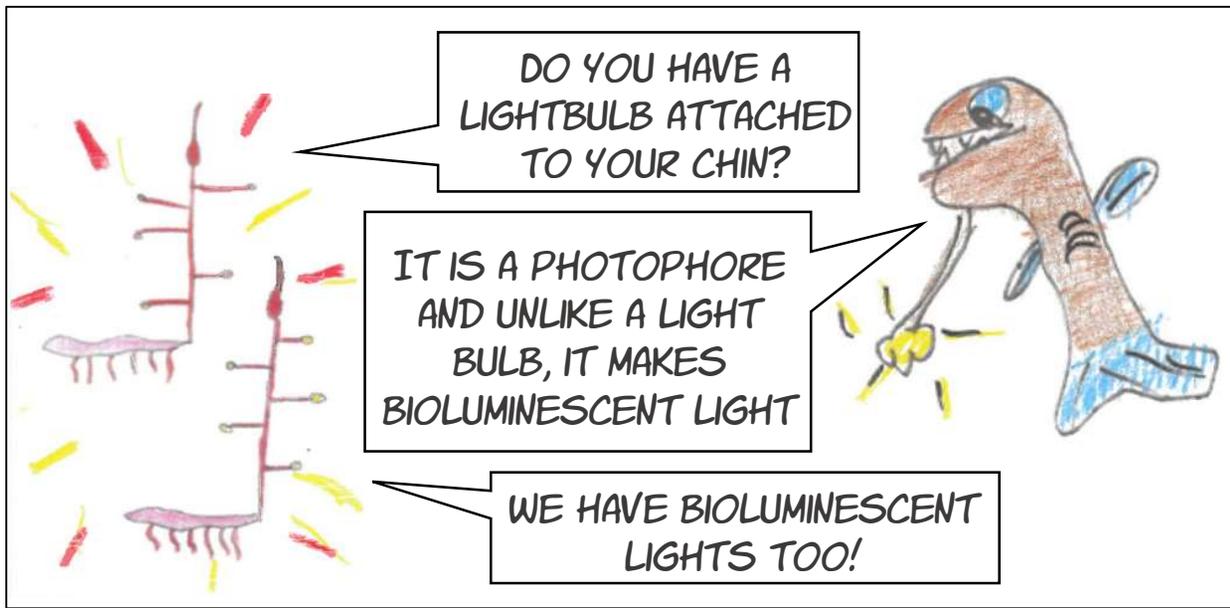
... SIPHONOPHORES!



WE'RE  
THE  
ZOIDS!

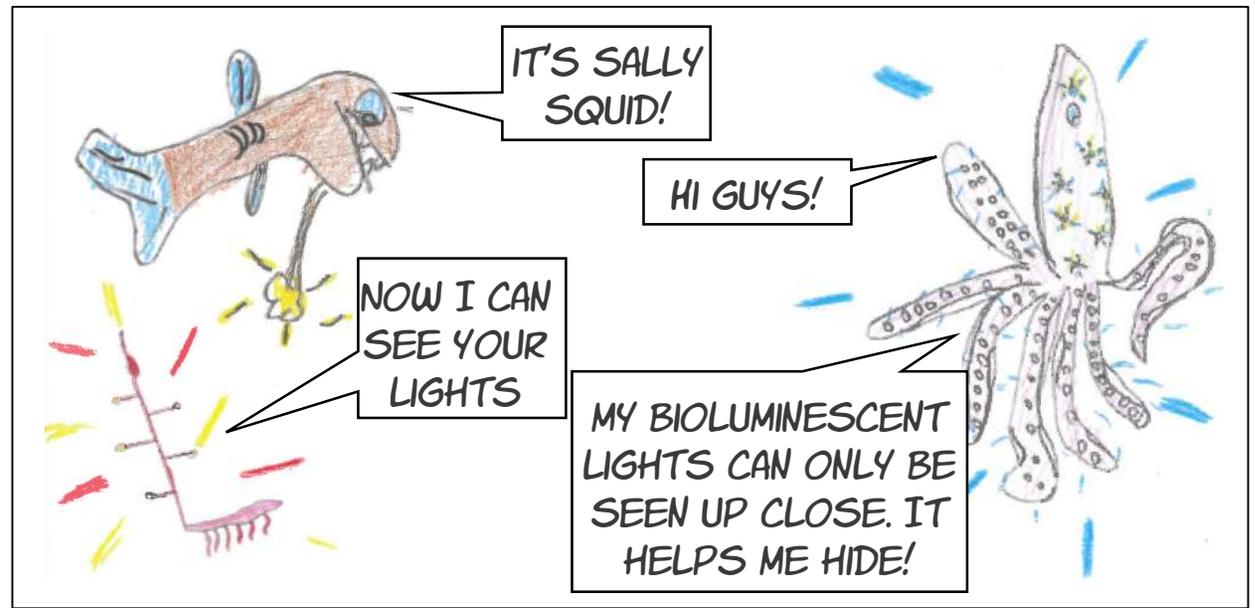
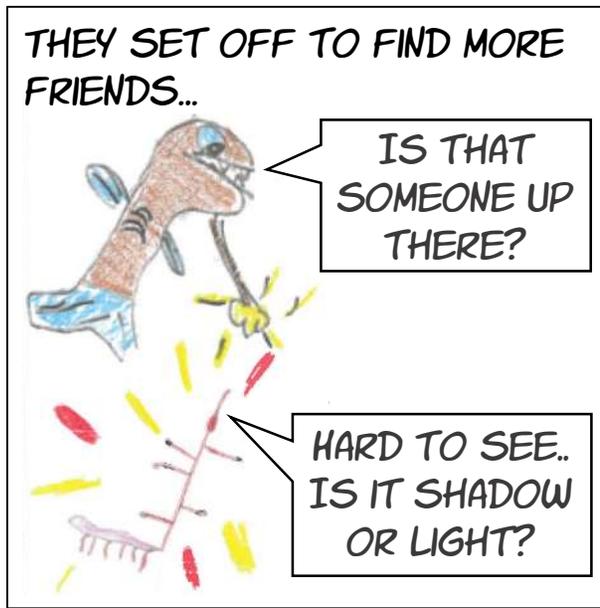
Connected to the whip dragon fish's chin is a dangling light-producing organ, called a photophore. It is not like a light bulb! It produces light through bioluminescence. A range of living creatures produce bioluminescence, including sea creatures, glow worms, fungi, and algae.

In the story, Mr Whip uses his photophore to search for friends in the dark ocean. In reality, the whip dragon fish dances around flinging its photophore from side to side to attract prey. When the prey gets close enough to eat it gulps the fish down. Scientists are still not sure how the prey gets close enough to eat!

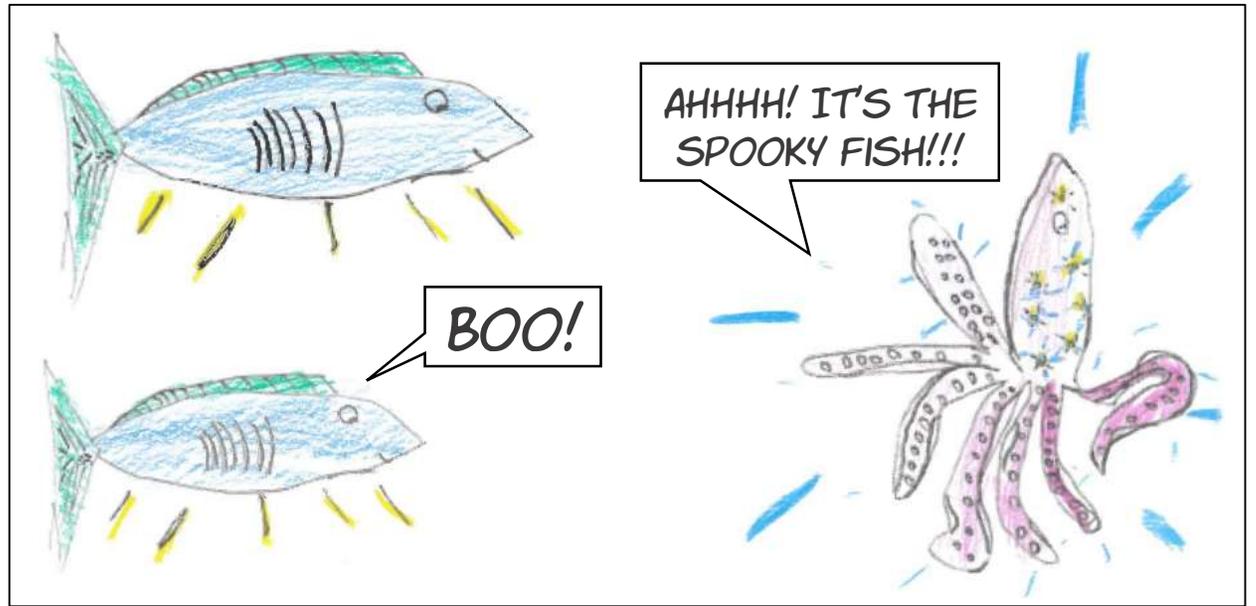


Siphonophores are predators and they use stinging cells to get their prey. Some species, have bioluminescent lights all across their bodies. They pretend to be other things such as fish or crabs and then, of course this will attract prey to eat. Siphonophores are made out of individual creatures called zoids. The interesting thing about siphonophores is that they can produce green, blue or even red light.

Bioluminescence is used for many different reasons including to find prey, or to just be able to see.

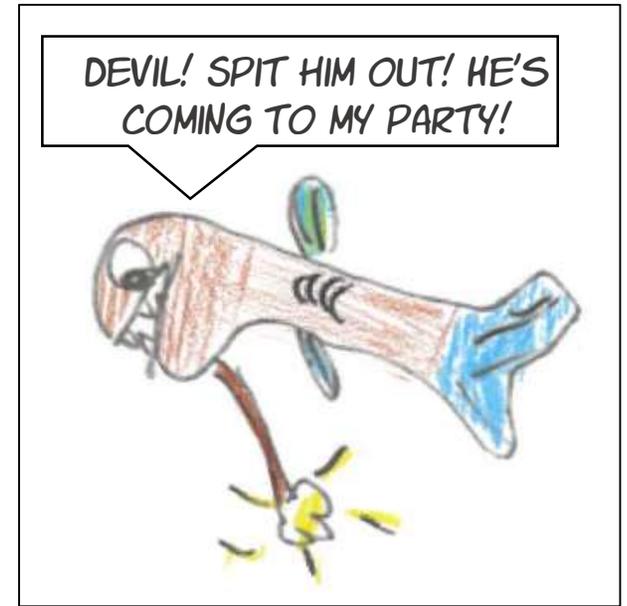
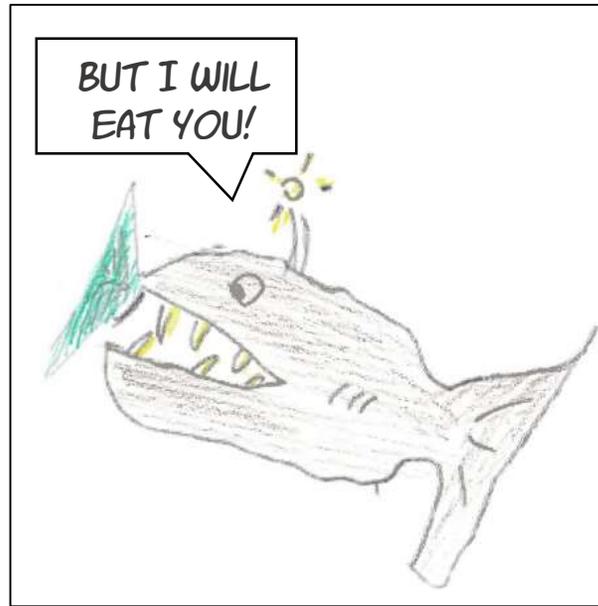
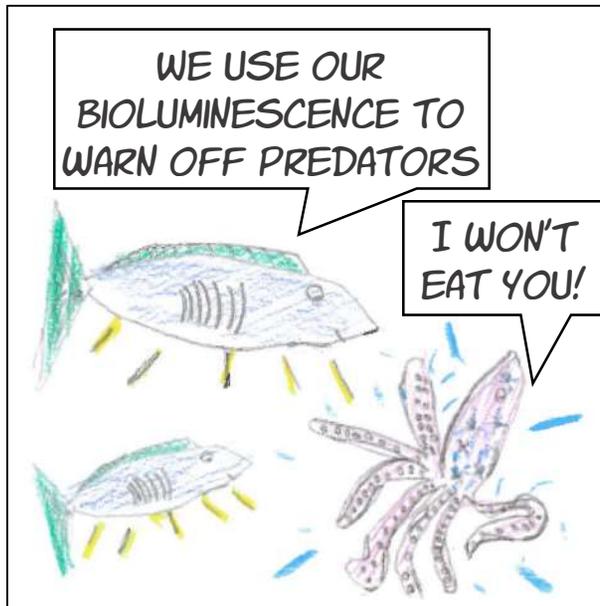


In the Twilight Zone, little to no light comes down from the surface. So, the Firefly Squid (*Watasenia scintillans*) 'hides' itself with light. At close range, its bioluminescent cells (called photophores) are very easy to see. But from a distance they prevent the outline of the squid from being seen and it camouflages with the background. This is called 'counter-illumination.'

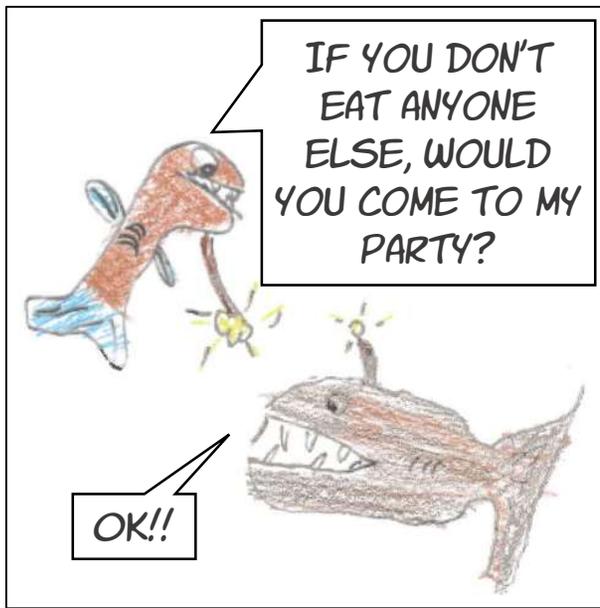


The Mirrorbelly Spookfish has been caught in waters where only some light reaches, such as the dim Twilight Zone. Scientists think its glowing belly may provide protection against predators.

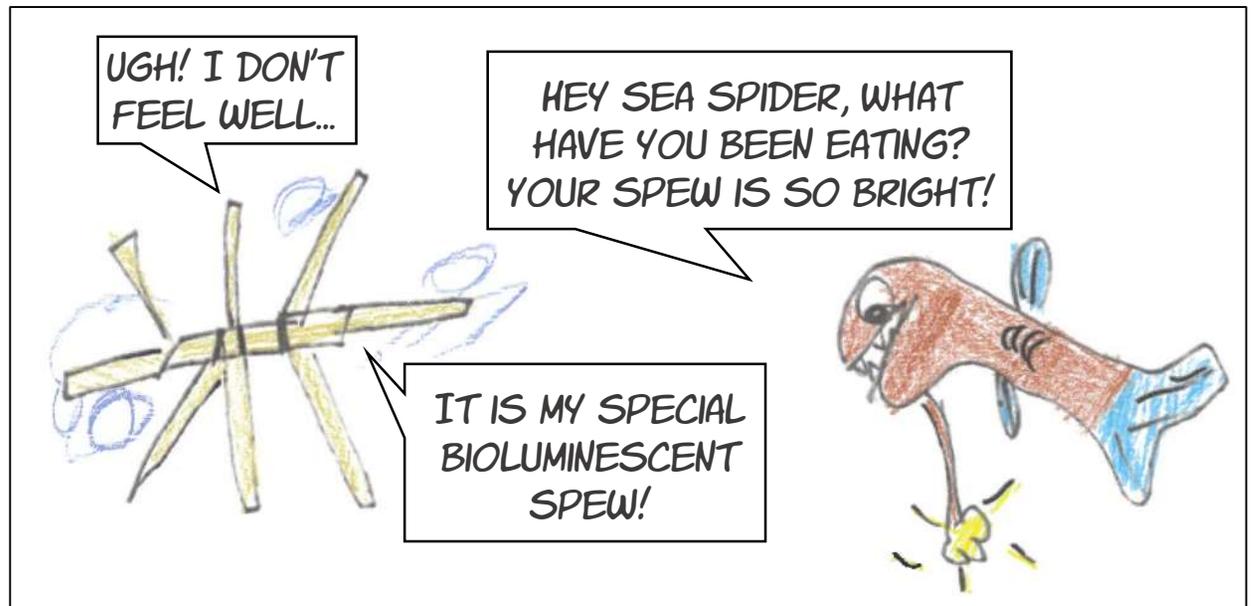
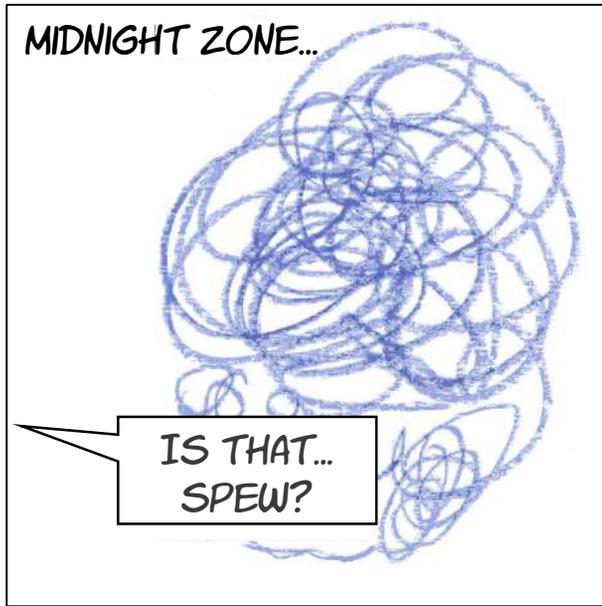
Its scientific name is *Opisthoproctus Grimaldi*.



Unfortunately, the Netdevil tried to eat the Mirror Belly Spookfish!!! But, that is exactly how Netdevils in the wild catch their prey. They turn on their light and wait and until their unsuspecting prey comes in and the Illuminated Netdevil eats it! Its scientific name is *Linophyrne Arborifera*.

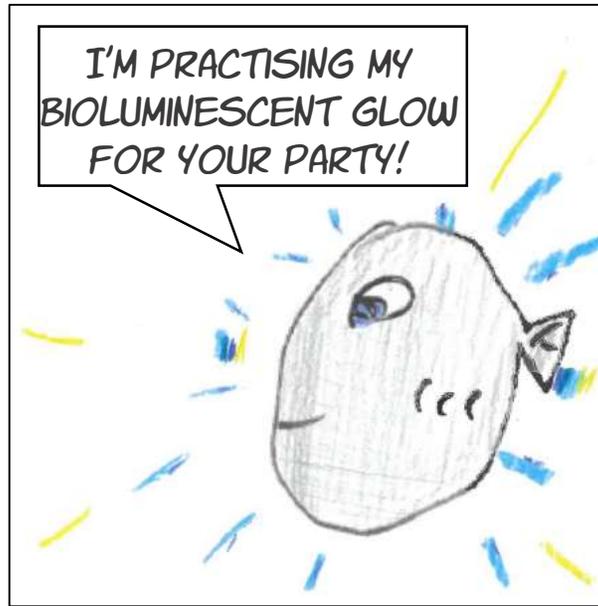
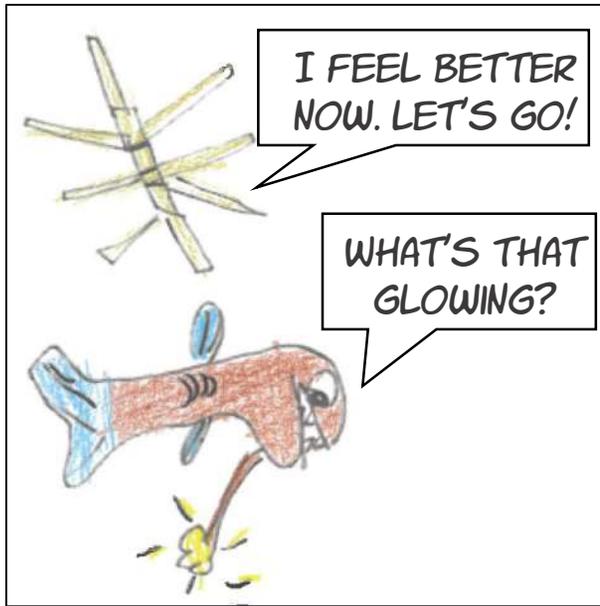


The ocean can be divided into five zones:  
Sunlit Zone: 0m to 200m water depth  
Twilight Zone: 200m to 1km water depth  
Midnight Zone: 1km to 3km water depth  
The Abyss: 3km to 6km water depth



Scientists are still not sure what this mysterious spew is and what causes it. But they do know that it was used by some kind of shrimp or squid. This sticky, bioluminescent mucus is used to startle or confuse predators.

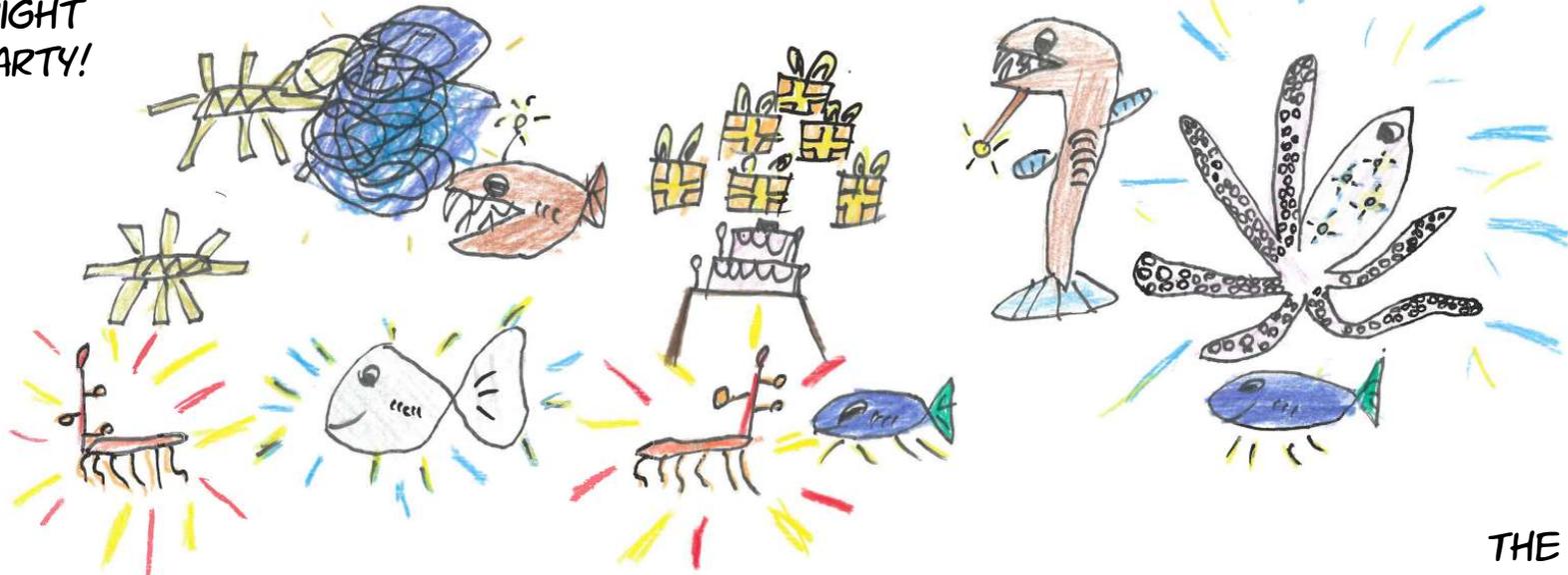
The sea spider's scientific name is *Colossendies*



AFTER FINDING OZ THE OSTRACOD AND ALL HIS FRIENDS, THEY ALL WENT BACK TO THE TWILIGHT ZONE FOR THE PARTY

Cuttlefish eat Ostracods so Ostracods have a successful defensive technique. When the Cuttlefish threatens them they release a bioluminescent 'bomb'. When it hits the Cuttlefish it makes the Cuttlefish glow. Now, the normally invisible fish is exposed to its own predators. Then, the Ostracod makes a quick escape.

WHAT A BRIGHT  
AND FUN PARTY!



THE END

All of the creatures at Mr Whip's birthday are bioluminescent!

They all use their bioluminescent light for different reasons. Whip dragonfishes, siphonophores, and illuminated netdevils use bioluminescence to attract prey. Mirrorbelly spookfishes, ostracods, and firefly squid use their bioluminescence to camouflage, hide and defend from predators.